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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,962	09/16/2005	Charles F Kutscher	NREL 03-17	8369
<div>Paul J White NREL 1617 Cole Boulevard Golden, CO 80401</div>				
7590 10/31/2007			EXAMINER DUONG, THO V	
			ART UNIT 3744	PAPER NUMBER
			MAIL DATE 10/31/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/549,962

Applicant(s)

KUTSCHER ET AL

Examiner

Tho v. Duong

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 18-37 and 50-65 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-37 and 50-65 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers.

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/16/05 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 9/16/05 and 12/7/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of group II in the reply filed on 8/14/07 is acknowledged.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed subject matter of claims 30, 31 and 34 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

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pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the claimed subject matter of “the fin body comprises a first body half comprising the first heat transfer surface and a planar mating surface and the fin body further comprises a second body half comprising the second heat transfer surface and a planar mating surface, the mating surfaces of the first and second body halves being adjacent” is not described in the disclosure.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 18-35 and 50-64 are rejected under 35 U.S.C. 102(b) as being anticipated by Yun et al. (US 5,697,432). Yung discloses (figures 2,4-10) a fin comprising a metallic fin body with first and second heat transfer surfaces and a leading edge; tube collars (20) formed in the fin body for receiving and contacting the tubes of the heat exchanger; a plurality of tabs (11)

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extending at a bend angle from the first and second heat transfer surfaces, wherein each of the tabs comprises a substantially planar body and wherein the tab bodies are positioned at offset angles; the offset angles ( $\theta_1$ ) being less than about 10 degrees as measured from a simple flow path extending across the fin body substantially perpendicular to the leading edge of the fin body; the bend angle is between about 70 and about 110 degrees as measured from the first or the second heat transfer surface area; the tabs have a height as measured from the first or second heat transfer surface that is less than about two thirds of the predetermined fin separation distance for the heat exchanger; the tabs are about 50% of the tabs extend from the first heat transfer surface; the tabs are positioned on the fin body such that the tabs are less densely distributed in wake region near the tube collars (behind the collar) and distal to the leading edge of the fin body; the tabs are arranged in rows relative to the leading edge; the adjacent ones of the rows are offset relative to each other such that the tabs in the adjacent rows are not coplanar (offset); the offset angle differ for at least some of the tabs ( $\theta_1$  and  $\theta_2$ ) and the offset angle are selected to position the tab bodies substantially parallel with a plurality of predetermined local flow paths for a fluid flowing; the tabs which are close to the rear of the collar are considered as delta winglet pair or a subset that has an offset angles greater than 20 degree to generate turbulence in air flowing across the fin body.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yun in view of Stoyhoff, Jr. (US 5,682,784). Yun substantially discloses all of applicant's claimed invention as discussed above except for the limitation that the tabs have a surface roughness greater than heat transfer surface area of the fin body. Stoyhoff teaches of (figures 3-4,8 and column 2, lines 24-27) a fin a rough surface (30) on louver (32) of the fin body (34) for a purpose of promoting turbulence in an airflow to enhance the heat transfer of the fin. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Stoyhoff's teaching in Yun's fin for a purpose of promoting turbulence in an airflow to enhance the heat transfer of the fin.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yun in view of Relfe, J (DE 3918610A) Yun substantially discloses all of applicant's claimed invention as discussed above except for the limitation that the heat transfer surface area is treated to promote turbulence. Relfe discloses (figures 1-2) a finned heat exchanger that has surface of the fin (1) being roughed up for a purpose of increasing exchange surface area and in addition creating turbulences in the air flow. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Relfe's teaching in Yun's device for a purpose of increasing exchange surface area and in addition creating turbulences in the airflow.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Paulman (US 6,247,527) discloses a fin array for heat transfer assembly.

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Kim et al. (US 5,875,839) discloses a heat exchanger for air conditioner.

Broadbent (US 5,042,576) discloses a louvered fin heat exchanger.

James Harrison (US 1,862,219) discloses a heat exchanger.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tho v. Duong whose telephone number is 571-272-4793. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tyler J. Cheryl can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TD



Tho v Duong  
Primary Examiner  
Art Unit 3744

TD  
October 29, 2007